

0

UNIVERSITY OF CALIFORNIA, SAN DIEGO



3 1822 02272 6566

BIOCHEMICALS

ORGANIC COMPOUNDS

for Research AND

DIAGNOSTIC REAGENTS

1993

ORDERING HOURS

Monday through Friday - 24 Hours a day
Saturday and Holidays - 8:00 a.m. to 5:00 p.m. (CST)
Sunday - 8:00 a.m. to 1:00 p.m. (CST)

INTELLECT - THE USA/CANADA	800-458-5157
OUTSIDE USA / CANADA CALL COLLECT	614-771-5750
FROM USA / CANADA	614-771-5750
OUTSIDE USA/CANADA	614-771-5750

For TWX, TELEX, Cable or Collect FAX Calls see page 3.

FOR BULK INQUIRIES CALL SAF
See page 16 for details.

Customer Service/Technical Service telephone numbers listed on card lines on front cover and on page 5.

Service available 24 hours
in 1993/1994 anytime

2175
5157

S

CHIMIE DE LA VIE

RESEARCH
1993

RESEARCH
1993

RESEARCH
1993

RESEARCH
1993

RESEARCH
1993

RESEARCH
1993

RESEARCH
1993

RESEARCH
1993

ALPHABETICAL LIST OF COMPOUNDS

ALPHAB

PRODUCT
NUMBERUS \$
PRODUCT
NUMBER

US \$

B

α-BORON ANALOGS OF GLYCINE AND DERIVATIVES
Isoelectronic and isosteric boron analogs of α-amino acids and their derivatives (peptides, amides) have exhibited hypolipidemic, anti-inflammatory, and anti-cancer activities in *in vivo* studies.
Ref.: Sood, A., et al., Eur. J. Med. Chem., 25, 301 (1990).

Borobetaine

See: Trimethylamine—Boranecarboxylic Acid
Page 977

Borobetaine Methyl Ester

See: Trimethylamine—Boranecarboxylic Acid Methyl Ester Page 977

Borobetaine-Met Methyl Ester

See: N-(Trimethylamine—Boranecarbonyl)-methionine Methyl Ester Page 977

Borobetaine-Pro Methyl Ester

See: N-(Trimethylamine—Boranecarbonyl)-proline Methyl Ester Page 977

Boro-N,N-dimethylglycine

See: Dimethylamine—Boranecarboxylic Acid
Page 356

Boro-N,N-dimethylglycine Ethylamide

See: Dimethylamine—Boranecarboxylic Acid N-Ethylamide Page 356

Boroglycine

See: Ammonia—Boranecarboxylic Acid Page 105

Boroglycine Ethylamide

See: Ammonia—N-Ethylcarbamoylborane
Page 105

Borosarcosine

See: Methylamine—Boranecarboxylic Acid
Page 649

Borosarcosine Ethylamide

See: Methylamine—Boranecarboxylic Acid N-Ethylamide Page 649

Boro-prefixed names are trademarks of Boron Biologicals, Inc.

B 8016 [8-35]	BORON ATOMIC ABSORPTION	
	STANDARD SOLUTION (pfs)	100 ml 11.80
	1,000 µg B per ml (nominal) in H ₂ O, actual value given on label.	500 ml 30.25 FOB Sigma

BORONIC ACID-AGAROSE

See: m-Aminophenylboronic Acid-Agarose under Affinity Chromatography Media Page 1443

B 4402 [8-35]	BORON NITRIDE (pfs)	
	[10043-11-5] BN FW 24.82	50 g 36.40 250 g 141.60

B 6636 [8-35]	BORON TRICHLORIDE (pfs)	
	1 M solution in hexane	100 ml 27.20 500 ml 26.95 FOB Sigma

BORON TRICHLORIDE-METHANOL

10% boron trichloride in methanol for preparing methyl esters of fatty acids and for transesterification of triglycerides.
[10294-34-5]

B 0877 [8-35]	BORON TRICHLORIDE (pfs)	
	Sealed ampules.	5 ml 12.80
	Shelf life is extended considerably in sealed ampules.	10 ml 17.35 25 ml 26.95 FOB Sigma

B 1002 [8-35]	BORON TRICHLORIDE-METHANOL	
	Bottle with screw-cap closure.	100 ml 24.40 500 ml 61.90 FOB Sigma

BORON TRIFLUORIDE ETHERATE

d = 1.15 g/ml
[109-63-7] C₂H₁₀BF₃O FW 141.9

B 6261 [8-35]	BORON TRIFLUORIDE ETHERATE	
	Brown liquid (pfs)	100 ml 13.90
		250 ml 18.45 1 liter 36.75 FOB Sigma

B 8764 [8-35]	BORON TRIFLUORIDE ETHERATE	
	Redistilled (pfs). Light yellow liquid.	100 ml 25.10 800 ml 67.00 FOB Sigma

BORON TRIFLUORIDE-METHANOL

14% boron trifluoride in methanol is useful for preparing methyl esters of fatty acids and for transesterification of triglycerides.
[373-57-9]

B 1127 [8-35]	BORON TRIFLUORIDE-METHANOL	
	14% solution in sealed ampule.	5 ml 11.85
	Shelf life is extended considerably in sealed ampules.	10 ml 16.20 25 ml 21.70 10 × 5 ml 77.60 FOB Sigma

B 1252 [8-35]	BORON TRIFLUORIDE-METHANOL	
	14% solution in bottle with screw-cap closure.	5 ml 9.35
		100 ml 9.65 250 ml 17.55 500 ml 29.75 1 liter 53.40 FOB Sigma

B 2388 [8-35]	BORON TRIFLUORIDE-METHANOL	
	50% solution in bottle with screw-cap closure (pfs).	5 ml 10.65
	Useful in esterification of aromatic acids. Ref.: Hallas, G., J. Chem. Soc., 5770 (1965).	50 ml 18.40 100 ml 33.20 250 ml 57.50 500 ml 89.40 FOB Sigma

BOTROCETIN

See: Venoms, Snake, from Bothrops jararaca
Page 1012

B 8776 [8-35]	BOTULINUM TOXIN A (pfs)	
	From Clostridium botulinum	10 µg 25.00
	Solution in 0.2 M NaCl, 0.05 M sodium acetate, pH 6.0. Not assayed by Sigma. WARNING: EXTREMELY HAZARDOUS! Safety data sheet accompanies this product. Additional safety data sheets available on request. Be sure you are aware of the hazardous nature of this item. [93384-43-1]	100 µg 82.35 FOB Sigma

B 6403 [8-35]	BOTULINUM TOXIN B (pfs)	
	From Clostridium botulinum	10 µg 25.00
	Solution in 0.05 M acetate, 0.2 M sodium chloride, pH 6.0. Not assayed by Sigma. WARNING: EXTREMELY HAZARDOUS! Safety data sheet accompanies this product. Additional safety data sheets available on request. Be sure you are aware of the hazardous nature of this item. [93384-44-2]	100 µg 73.50 FOB Sigma

B 9027 [8-35]	BOTULINUM TOXIN C (pfs)	
	From Clostridium botulinum	10 µg 26.50
	Solution in 0.05 M phosphate buffer, pH 6.0. Not assayed by Sigma. [93384-45-3]	100 µg 119.50 FOB Sigma

PRODUCT
NUMBER

B 1397 [8-35]	BOTULINUM TOXIN D (pfs)	
	From Clostridium botulinum	10 µg 25.00
	Solution in 0.2 M sodium chloride, 0.05 M sodium acetate, pH 6.0. Not assayed by Sigma. WARNING: EXTREMELY HAZARDOUS! Safety data sheet accompanies this product. Additional safety data sheets available on request. Be sure you are aware of the hazardous nature of this item. [93384-46-4]	100 µg 82.35 FOB Sigma

B 6528 [8-35]	BOTULINUM TOXIN E (pfs)	
	From Clostridium botulinum	10 µg 25.00
	Solution in 0.05 M acetate, 0.2 M sodium chloride, pH 6.0. Not assayed by Sigma. WARNING: EXTREMELY HAZARDOUS! Safety data sheet accompanies this product. Additional safety data sheets available on request. Be sure you are aware of the hazardous nature of this item. [93384-47-5]	100 µg 82.35 FOB Sigma

B 9152 [8-35]	BOTULINUM TOXIN F (pfs)	
	From Clostridium botulinum	10 µg 25.00
	Solution in 0.05 M acetate buffer, 0.2 M NaCl, pH 6.0. Not assayed by Sigma. [107231-15-2]	100 µg 82.35 FOB Sigma

BOUIN'S SOLUTION

See: Diagnostic Kits and Reagents

BOVINE ADRENAL MEDULLA P

See: Bioactive Peptides Page

BOVINE IgG

See: Immunochemicals Page

BOVINE PROTEINS, Antisera to

See: Immunochemicals Page

BOVINE ALBUMIN

See: Albumin, Bovine Page 6

BOVINE EMBRYONIC FLUID

See: Tissue Culture Media and

BOVINE SERUM ALBUMIN

See: Albumin, Bovine Page 6

See also: Molecular Biology I

BOWMAN-BIRK INHIBITOR

See: Trypsin-Chymotrypsin I

BPOC-GLY-GLY-HIS-PHE

B 8393 [8-35]	HYDRAZIDE (pfs)	
	(Biphenylisopropoxy)carboxylic acid	10 µg 25.00
	Gly-Gly-His-Phe-NHNH ₂ [115035-44-4] C ₂₃ H ₁₈ N ₆ O ₄ FW	100 µg 73.50 FOB Sigma

BPST CHLORIDE

See: 2-(2'-Benzothiazolyl)-5-3-(4'-phthalhydrazidyl)tetra:
Page 147

BRADYKININ

See: Bioactive Peptides Page

Lys-[Ala⁷]-BRADYKININ

See: Bioactive Peptides Page

BRADYKININ POTENTIATOR I

See: Bioactive Peptides Page

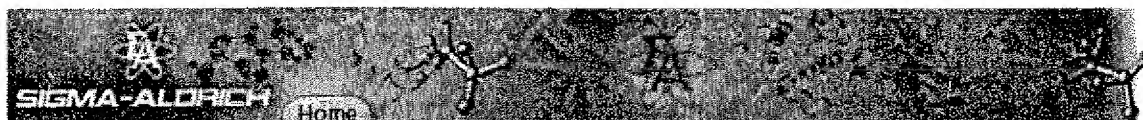
BRADYKININ POTENTIATOR II

See: Bioactive Peptides Page

ALPHABETICAL LIST OF COMPOUNDS

PRODUCT NUMBER	US \$	PRODUCT NUMBER	US \$
BOTULINUM TOXIN D (pfs)			
B 1397	10 µg 33.70	BRAIN ACETONE POWDER	
From Clostridium botulinum	100 µg 187.00	Prepared with acetone only.	
Solution in 0.2 M sodium chloride, 0.05 M sodium acetate, pH 6.0	FOB Sigma	B 0508	Bovine
Not assayed by Sigma.			5 g 10.40
WARNING:			10 g 18.20
EXTREMELY HAZARDOUS!			25 g 39.05
Safety data sheet accompanies this product. Additional safety data sheets available on request. Be sure you are aware of the hazardous nature of this item.			100 g 125.10
[93384-46-4]		B 4132	Cat
			1 g 32.35
BOTULINUM TOXIN E (pfs)			
B 6528	10 µg 31.75	B 7881	Dog
From Clostridium botulinum	100 µg 176.40		1 g 26.35
Solution in 0.05 M acetate, 0.2 M sodium chloride, pH 6.0.	FOB Sigma		5 g 84.65
Not assayed by Sigma.		B 9261	Goat
WARNING:			1 g 5.35
EXTREMELY HAZARDOUS!			10 g 24.60
Safety data sheet accompanies this product. Additional safety data sheets available on request. Be sure you are aware of the hazardous nature of this item.		B 4507	Guinea Pig
[93384-47-5]			1 g 32.55
BOTULINUM TOXIN F (pfs)			
B 9152	10 µg 36.80	B 9136	Mouse
From Clostridium botulinum	100 µg 204.45		100 mg 10.40
Solution in 0.05 M acetate buffer, 0.2 M NaCl, pH 6.0.	FOB Sigma		250 mg 20.15
Not assayed by Sigma.			1 g 54.25
[107231-15-2]		B 9882	Pigeon
			1 g 7.95
BOVIN'S SOLUTION			
See Diagnostic Kits and Reagents Section.			
BOVINE ADRENAL MEDULLA PEPTIDES			
See: Bioactive Peptides Page 1066			
BOVINE IgG			
See: Immunochemicals Page 1260			
BOVINE PROTEINS, Antisera to			
See: Immunochemicals Page 1190			
BOVINE ALBUMIN			
See: Albumin, Bovine Page 63			
BOVINE EMBRYONIC FLUID			
See: Tissue Culture Media and Reagents Page 1414			
BOVINE SERUM ALBUMIN			
See: Albumin, Bovine Page 63			
See also: Molecular Biology Products Page 1354			
BOWMAN-BIRK INHIBITOR			
See: Trypsin-Chymotrypsin Inhibitor Page 992			
BPOC-GLY-GLY-HIS-PHE			
	25 mg 24.85	BRAIN EXTRACT	
B 8393	50 mg 41.35	B 1502	Type I: Folch Fraction I
(Biphenylisopropylloxycarbonyl-Gly-Gly-His-Phe-NH ₂)	100 mg 68.85		25 mg 6.05
[115035-44-4] C ₃₅ H ₄₀ N ₆ O ₆ FW 668.8			100 mg 11.80
			Sealed ampule.
			1 g 57.35
BPST CHLORIDE			
See: 2-(2-Benzothiazolyl)-5-styryl-3-(4-phthalhydrazidyl)tetrazolium Chloride			
Page 147			
BRADYKININ			
See: Bioactive Peptides Page 1039			
Lys-(Ala⁷)-BRADYKININ			
See: Bioactive Peptides Page 1040			
BRADYKININ POTENTIATOR B			
See: Bioactive Peptides Page 1041			
BRADYKININ POTENTIATOR C			
See: Bioactive Peptides Page 1041			
			(Continued)

Bulk quantities available through SAF Bulk Chemicals - see page 16.



[Register for additional site benefits.](#) | [Login](#) | [Your Profile](#) | [Order Center](#) | [Search](#) | [Oligos & Peptides](#) |

[Product Name](#)



SIGMA-ALDRICH

Specification Sheet

[Related](#)

[MSDS](#)

[Specifications](#)

[Certificates](#)

[Enter](#)

[More Information](#)

[Link](#)

[Product](#)

[Page](#)

[Print Page](#)

[Bulk Quote](#)

[Ask A Question](#)

[Email Feedback](#)

Product Name	Botulinum Toxin A from <i>Clostridium botulinum</i> , lyophilized powder
Product Number	B8776
Product Brand	Sigma
CAS Number	93384-43-1
Storage Temp	-20°C
TEST	SPECIFICATION
APPEARANCE	LYOPHILIZED POWDER
PURITY BY SDS-PAGE	SINGLE MAJOR BAND WITH A MOLECULAR WEIGHT OF APPROX. 150 KDA

[Last 5 Pages](#)

B8776

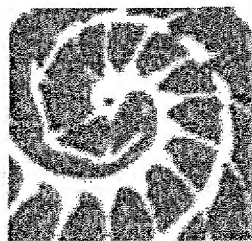
Use of this web site constitutes your acceptance of the [Site Use Terms](#)

[privacy](#) | [terms and conditions of sale](#) | [Business Development](#)

© 2007 Sigma-Aldrich Co. Reproduction forbidden without permission.
Sigma-Aldrich brand products are sold exclusively through Sigma-Aldrich, Inc. Best viewed in IE6 or higher

LIST BIOLOGICAL LABORATORIES, INC.

WELCOME TO LIST LABS



We are the world leader in producing bacterial toxins over 25 years for research including cholera, pertussis, tetanus, diphtheria, pasteurella multocida, shiga-like and botulinum toxins. Toxin subunits, recombinant PA, LF, and EF from *Bacillus anthracis*, toxoids, antisera and LPS are also available. Check our catalog for a complete list of products. If you have an interest in a particular toxin not mentioned, please contact us directly. We do manufacturing contract and solicit customers' ideas for new products.

APPLICATIONS	BACTERIAL TOXINS	ANTISERA, ANTIBODIES, and PEPTIDE SUBSTRATES
<u>CTIN CYTOSKELETON REGULATORS</u>	<u>Anthrax Toxins from <i>Bacillus anthracis</i></u>	<u>SNAPTide® (U.S Patent # 6,504,006), a peptide substrate for botulinum toxin type A</u>
<u>ADJUVANTS AND CARRIER</u>	<u>Botulinum Toxins from <i>C. botulinum</i></u>	<u>MAPKKide® Peptide Substrate (o-Abz/Dnp) for Lethal Factor</u>
<u>APOPTOSIS</u>	<u>Cholera Toxins from <i>V. cholerae</i></u>	<u>VAMPTide® Peptide Substrate (oAbz/Dnp) for <i>C. botulinum</i> type B</u>
<u>RET SUBSTRATES</u>	<u>Difficile Toxins from <i>C. difficile</i></u>	<u>SNAP Etide™ Peptide Substrate (o-Abz/Dnp) for <i>C. botulinum</i> type E</u>
<u>TOXOIDS</u>	<u>Tetanolysin from <i>C. tetani</i></u>	<u>SNAP-25 Recombinant Protein Substrate for <i>C. botulinum</i> Type A and E neurotoxin</u>
<u>IMUNE RESPONSE MODULATORS</u>	<u>Neurominidase from <i>Vibrio cholerae</i></u>	<u>Goat Anti-Exotoxin A Antibody for Exotoxin A from <i>P. aeruginosa</i></u>
<u>MEMBRANE TRAFFIC INTERFERERS</u>	<u>Diphtheria Toxins and CRM₁₉₇ from <i>C. diphtheriae</i></u>	<u>Goat Anti-Cholera toxin B Subunit Antibody for Cholera Toxin B Subunit</u>
<u>METALLOPROTEASE INHIBITORS</u>	<u>Pertussis Toxins from <i>B. pertussis</i></u>	<u>Goat Anti-Toxin A Antibody for Toxin A from <i>Clostridium difficile</i></u>
<u>NEURONAL MARKERS</u>	<u>Shiga Like Toxins from <i>E. coli</i></u>	<u>Anti-Shiga Like Toxin 1 and 2 (Mouse IgG1-K) Monoclonal</u>
<u>TOXIN FORMERS</u>	<u>Tetanus Toxins from <i>C. tetani</i></u>	<u>Goat Anti-PA, Anti-LF, and Anti-EF from <i>Bacillus anthracis</i></u>
<u>PROTEIN SYNTHESIS INHIBITORS</u>	<u>Alpha toxin from <i>S. aureus</i></u>	<u>Anti-Adenylate Cyclase Toxin Murine Monoclonal Antibody 3D1</u>

<u>RECEPTORS</u>	<u>Enterotoxin type B from <i>S. aureus</i></u>	<u>Anti-RTX Murine Monoclonal Antibody 9D4</u>
<u>SCREENING FOR BOTULINUM TOXIN INHIBITORS</u>	<u>Pasteurella Multocida Toxin</u>	RECOMBINANT PROTEINS and MORE TOXINS
<u>GENAL TRANSDUCTION</u>	<u>Exotoxin A from <i>P. aeruginosa</i></u>	<u>Botulinum Neurotoxin Light Chain Type A, B, C, D, E and F ^{NEW}</u>
<u>OPERANTIGENS</u>	<u>Adenylate Cyclase Toxin from <i>B. pertussis</i></u>	<u>Tetanus Toxin Light Chain</u>
<u>POPOLYSACCHARIDES</u>		<u>FHA</u>

Posters:

Internally Quenched Fluorogenic Substrates for Anthrax Lethal Factor. N. Shine, L. Eaton, K. Crawford presented at the 5th International Conference on Anthrax, March 30, 2003 in Nice, France

Rapid, Sensitive and Specific Assay to Measure the Endoprotease Activity of Botulinum Toxin Type A. N. Shine, T. Christian, L. Eaton, K. Crawford - presented at the 5th International Conference on Basic and Therapeutic Aspects of Botulinum and Tetanus Toxins, June 2005 in Denver, Colorado, USA.

Comparison of Activity of Botulinum Neurotoxin Type A Holotoxin and Light Chain Using VAPtide™ FRET Substrates. T. Christian, N. Shine, L. Eaton, K. Crawford - presented at the 5th International Conference on Basic and Therapeutic Aspects of Botulinum and Tetanus Toxins, June 2005 in Denver, Colorado, USA.

Sensitive and Specific Assay to Measure Endoprotease Activity of Botulinum Toxin Type A Holotoxin in Milk. Nancy Shine, Linda Eaton, and Karen Crawford presented at the 42nd Annual IBRCC, December 5-8, 2005 in Baltimore, Maryland.

Physical Characteristics of rLF and rPA: Effects on Enzymatic Activity and Binding. Nancy Shine, Andy Le, Linda Eaton, and Karen Crawford presented at Bacillus Act 2005, September 25-29, 2005 in Santa Fe, New Mexico.

To request one of these posters, please send email to [Dr. Shine](mailto:Dr.Shine)

[Regular Pricing](#) | [Online Ordering](#) | [Contact List Labs](#) | [Application](#) | [New Products](#) | [Alphabetical Product List](#) | [Technical Information](#) |

| [International Distributors](#) | [Contract Manufacturing](#) | [Return Policy](#) | [Privacy Policy](#) |

Copyright ©1978-2004 www.listlabs.com. All Rights Reserved. Send any comments or suggestions regarding this site to webmaster



BOTULINUM NEUROTOXINS

Clostridium botulinum neurotoxins (BoNTs) block the release of acetylcholine from peripheral cholinergic nerve endings¹ and cause botulism in man and animals.^{2,3} Seven immunologically distinct serotypes of neurotoxin, designated types A through G, have been identified.⁴ Each is synthesized as a single polypeptide chain (M_R 150,000).⁵ When botulinum neurotoxin is exposed to proteases, either during cultivation of the *Clostridium botulinum* organism or subsequent to purification of the toxin, specific peptide bonds are cleaved or "nicked" resulting in the formation of a dichain molecule.^{4,6} Dichain neurotoxin is composed of a light chain region (M_R 50,000) linked by disulfide bonds and non-covalent interactions to a heavy chain (M_R 100,000).⁷ Conversion of the single chain form of a neurotoxin to its dichain form generally results in increased toxicity.⁷ When the light and heavy chains of botulinum toxin are separated from one another, neither is capable of blocking neurotransmitter release in unaltered cells. However, the light chain alone is capable of blocking acetylcholine release if injected directly into the cell cytosol.^{8,9}

Botulinum neurotoxins resemble other toxins such as ricin, exotoxin A, diphtheria, cholera and tetanus toxins. Each of the toxins contain a region that is responsible for binding and navigation¹, and a second region which has enzymatic activity.¹⁰ In the case of clostridial neurotoxins, these regions are represented by the heavy and light chains, respectively.¹⁰ Blockage of acetylcholine release from nerve endings by botulinum toxin proceeds through a multi-step process that includes binding, receptor-mediated internalization, translocation across a membrane, reduction and proteolysis of substrates.^{11,12,13}

All types of botulinum toxin are zinc-dependent proteases. Enzymatic activity resides exclusively in the light chain of the molecules. These enzymes cleave SNARE proteins, synaptobrevin 2, syntaxin and SNAP 25, which form the core of a complex involved in the fusion of transmitter-containing vesicles with the plasma membrane.¹⁰ Prior to fusion, the SNARE proteins in the vesicle and plasma membrane interact forming a complex which contracts with an increase in the intracellular calcium concentration, pulling the vesicle close to the plasma membrane. Interaction between lipids in the two membranes allow the vesicle and nerve terminal active zone to fuse.^{14,15} During this fusion, the contents of the vesicles, mainly neurotransmitters, are released, and the inner surface of the vesicles is exposed to the synaptic cleft. If one of the SNARE proteins is cleaved by a neurotoxin, complex formation cannot occur and fusion is interrupted. Botulinum toxins of type B, D, F and G cleave synaptobrevin 2 (M_R 19,000) which is located in vesicular membranes.¹⁰ Syntaxin (M_R 36,000) and SNAP 25 (M_R 25,000) are attached to the inner surface of the plasma membrane in nerve endings close to the active zone. Syntaxin is cleaved by botulinum toxin type A and SNAP 25 by botulinum toxins type A, C1, E.^{16,17,18}

Toxins must pass through the plasma membrane of nerve cells to gain access to their intracellular targets. A thirty-four amino acid sequence on the C-terminal of both botulinum toxins type A and type B binds to specific types of gangliosides with a low affinity.¹ In addition, a motif within the C-terminal half of the heavy chain is thought to bind to a

protein, representing the high affinity binding site.¹⁰ In the case of BoNT/B, synaptotagmin, a protein spanning the vesicular membrane, was shown to function as the receptor.¹⁹ Physiologically this protein regulates fusion through an interaction with calcium.^{20,21} The N-terminal part of this protein projects into the lumen of the vesicle and is exposed to the synaptic cleft only when exocytosis occurs. Presentation of the binding protein allows the toxin to attach to the membrane. Following endocytosis the synaptotagmin-bound toxin molecules are trapped in vesicles that then pass through the endosomal compartment, where the contents are acidified by an ATP-driven proton carrier.²² The N-terminal half of the heavy chain may undergo conformational changes at low pH allowing its insertion into and penetration through the endosomal membrane.²² As neurotoxin enters the cytosol, the disulfide link between light and heavy chains is reduced by enzymes.^{9,7} At this point, light chains are active and able to cleave SNARE proteins which are not complexed. This multi-step process is similar to the intoxication with tetanus toxin, another closely related clostridial neurotoxin.^{1,24}

Membrane fusion is a highly conserved process, occurring in all secretory cells.^{18,25,26,27} Light chains of clostridial neurotoxins are capable of blocking secretion if they gain access to their substrates in non-neuronal cells. To poison cells lacking receptors for the uptake, neurotoxins or their light chains may be artificially introduced. When these toxins are introduced in secretory cells, secretion stops. Cell types from various origins have been shown to exhibit a toxin-sensitive fusion apparatus.^{9,28,29}

Botulinum neurotoxins are valuable research tools in studies aimed at elucidating the mechanisms involved in vesicle trafficking, and in gaining an understanding of the underlying events of synaptic transmission.^{30,31} Botulinum neurotoxins are the most deadly bacterial toxins known. Their ability to cause cessation of neurotransmitter release at the neuromuscular junction and autonomic nerve endings can lead to disturbances as well as to fatal paralysis. Ironically, it is this property of botulinum toxin which has been successfully harnessed and used clinically to treat certain neuromuscular disorders in humans, such as blepharospasm, strabismus and torticollis.³

List Biological Laboratories, Inc., provides highly purified preparations of botulinum neurotoxins from *Clostridium botulinum* types A and B. In addition, purified heavy chains and toxoids derived from each of these toxins are also available. Furthermore, recombinantly produced light chains from both types A, B, C, D and E have been developed. These light chains are non-toxic proteins that retain the enzymatic activity encoded by the holotoxin. They lack any binding domain and are unable to gain access to intracellular targets without microinjection. Light chain from type A is capable of cleavage of the eukaryotic substrate SNAP 25 and is also highly active with the quenched fluorogenic peptide substrate, SNAPTideTM, that has been developed by List. The light chains from type B and D are capable of cleavage of the eukaryotic substrate synaptobrevin 2, and the light chain from type C is capable of cleavage of the substrate Syntaxin 1A. Contact List for current information on available fluorogenic peptides.

©1994 LBL, Inc. 7/96, 7/03, 10/04, 3/05, 4/05, 6/05

These products are intended for research purposes only and are not intended for use in humans. For further information, please contact List Biological Laboratories, Inc.

See a Typical Certificate of Analysis for product #: [130A](#), [130B](#), [610](#), [620](#), [625](#), [630](#), [635](#), [133](#), [136](#), [139](#), [520](#), [521](#), [528](#), or [529](#).

See a Material Safety Data Sheet for product #: [130](#), [610](#), [132](#), [133](#), [136](#), [138](#), [139](#).

References

[Home](#) | [Contact List Labs](#) | [Price List](#)



MATERIAL SAFETY DATA SHEET #130 and #9130 Botulinum Neurotoxin A

[Home](#)[Regular Price](#)[Online Catalog](#)[Alpha-Botulinum
Product](#)[Technical Information](#)[Applications](#)[International
Distribution](#)[New Products](#)[Contract
Manufacturing](#)[Contact List](#)

Hazardous Ingredients:

Neurotoxin type A from *Clostridium botulinum* is a 150,000 dalton protein and is one of the most potent toxins known. This formulation also includes 1.25% lactose.

Physical Properties:

This product is provided as a white lyophilized powder. It is soluble in distilled water.

Fire and Explosion Hazard Data:

Neurotoxin type A is combustible but not flammable. Use dry chemical, halon, carbon dioxide, polymer foam or water fire extinguisher. Wear self-contained breathing apparatus and full protective clothing.

Health Hazard:

The LD₅₀ in humans is estimated at 1 ng/kg (Gill, D.M. (1982) *Microbiol. Rev.* **46**, 86-94). It is a very potent neurotoxin which may be fatal if inhaled, ingested, injected, or introduced into a wound. The incubation period is usually 4 hours to 8 days. Symptoms include muscle weakness especially in the face and neck early on, then the upper extremities, and finally the lower extremities, fatigue, dizziness, incoordination, an extremely dry mouth, blurred vision, sensitivity to bright lights, difficulty swallowing, drooling, difficulty speaking clearly, slurring, difficulty breathing, nausea, abdominal bloating, constipation, and difficulty urinating. There are no mentation nor sensory abnormalities and no fever.

If contact occurs, flush the eyes, skin, mouth (if conscious), or wounds thoroughly with water. For ingestion, dilute with water and induce vomiting. Seek medical attention, since supportive therapy will be required if symptoms occur. Immune serum, available from the U.S. Public Health Service, Centers for Disease Control, at 404-639-3311 days or 404-639-2888 after hours, may also be a part of the medical treatment.

Reactivity Data:



TYPICAL CERTIFICATE OF ANALYSIS #130A Botulinum Neurotoxin A

[Home](#)[Regular Price](#)[Online Quote](#)[Alpha Products](#)[Technical Info](#)[Applications](#)[International Distributors](#)[New Products](#)[Contract Manufacturing](#)[Contact Us](#)

Contents:

Each 10 μ g vial of botulinum toxin type A, when reconstituted with 100 μ l of appropriate buffer, contains 1.25% lactose. To insure maximum recovery, reconstitution liquid must contain 1.0 mg/ml BSA. When the toxin is used for *in vitro* studies, it is preincubated in a buffer containing 5 mM dithiothreitol for 30 minutes in order to reduce and thereby activate the toxin. For use with SNAPtide^R, Product # 520 and #521, see the corresponding Certificate of Analysis for the appropriate buffer.

Concentration:

Protein concentration was determined by absorbance at 280 nm using an extinction coefficient of 1.63¹ for a 1 mg/ml solution.

Gel Electrophoresis:

When examined on 7.5% SDS-polyacrylamide gels prepared according to the method of Wyckoff,² a modification of the Laemmli³ gel system, this protein migrates as a single major band with an apparent molecular weight of approximately 150,000 daltons. In the presence of a reducing agent, the preparation migrates as two bands with apparent molecular weights of 100,000 and 50,000 daltons.

Storage:

This product is supplied as a lyophilized powder which has been stoppered under vacuum. Store at 4°C prior to and following reconstitution. Freezing is not recommended unless the product is stored aliquoted in the presence of 0.1% albumin.

Toxicity:

Botulinum toxin is the most deadly bacterial toxin known to man. The lethal dose in unvaccinated humans is estimated at 1 ng/kg.⁴ Consult the MSDS for further information.